

Summary of the Resolution of the Key Technical Issue on Igneous Activity - Agreements Reached

<u>Subissue #</u>	<u>Subissue Title</u>	<u>Status</u>	<u>NRC/DOE Agreements</u>
1	Probability of future igneous activity	Closed-Pending	See modification of Agreement IA.1.02 in Attachment 2
2	Consequences of future igneous activity	Closed-Pending	IA.2.17 - DOE will evaluate conclusions that the risk effects (i.e., effective annual dose) of eolian and fluvial remobilization are bounded by conservative modeling assumptions in the TSPA-SR, Rev 00, ICN1. DOE will examine rates of eolian and fluvial mobilization off slopes, rates of transport in Fortymile Wash, and rates of deposition or removal at proposed critical group location. DOE will evaluate changes in grain size caused by these processes for effects on airborne particle concentrations. DOE will also evaluate the inherent assumption in the mass loading model that the concentration of radionuclides on soil in the air is equivalent to the concentration of radionuclides on soil on the ground does not underestimate dose (i.e., radionuclides important to dose do not preferentially attach to smaller particles). DOE will document the results of investigations in the AMR, <i>Eruptive Processes and Soil Redistribution</i> ANL-MGR-GS-000002, expected to be available in fiscal year 2003 and in the AMR, <i>Input Parameter Values for External and Inhalation Radiation Exposure Analysis</i> , ANL-MGR-MD-000001, available FY 2003, or another appropriate technical document.

2	Consequences of future igneous activity - Cont.	<p>IA.2.18 - DOE will evaluate how the presence of repository structures may affect magma ascent, conduit localization, and evolution of the conduit and flow system. The evaluation will include the potential effects of topography and stress, strain response on existing or new geologic structures resulting from thermal loading of HLW, in addition to a range of physical conditions appropriate for the duration of igneous events. DOE will also evaluate how the presence of engineered repository structures in the LA design (e.g., drifts, waste packages, backfill, etc.) could affect magma flow processes for the duration of an igneous event. The evaluation will include the mechanical strength and durability of natural or engineered barriers that could restrict magma flow within intersected drifts. The results of this investigation will be documented in an update to the AMR, <i>Dike Propagation and Interaction with Drifts</i>, ANL-WIS-MD-000015, expected to be available in FY 2003, or another appropriate technical document.</p>
		<p>IA.2.19 - DOE will evaluate waste package response to stresses from thermal and mechanical effects associated with exposure to basaltic magma, considering the results of evaluations attendant to IA Agreement 2.18. As currently planned, the evaluation, if implemented, would include (1) appropriate at-condition strength properties and magma flow paths, for duration of an igneous event; and (2) aging effects on materials strength properties when exposed to basaltic magmatic conditions for the duration of an igneous event, which will include the potential effects of subsequent seismically induced stresses on substantially intact waste packages. DOE will also evaluate the response of Zone 3 waste packages, or waste packages covered by backfill or rockfall, if exposed to magmatic gases at conditions appropriate for an igneous event, considering the results of evaluations attendant to IA Agreement 2.18. If models take credit for engineered barriers providing delay in radionuclide release, DOE will evaluate barrier performance for the duration of the hypothetical igneous event. The results of this investigation would be documented in an update to the technical product <i>Waste Package Behavior in Magma</i> CAL-EBS-ME-000002, which would be available by the end of FY 2003, or another appropriate technical document.</p>

2	Consequences of future igneous activity - Cont.	<p>IA.2.20 - DOE will evaluate how ascent and flow of basaltic magma through repository structures could result in processes that might incorporate HLW, considering the results of evaluations attendant to IA Agreements 2.18 and 2.19. As currently planned, the evaluation, if implemented, would include the potential for HLW incorporation along reasonable potential flow paths that could develop during an igneous event. The evaluation would also include the physical and chemical response of HLW and cladding after heating and potential disruption of waste package and contents, for waste packages remaining in drifts. The evaluation would examine effects that may result in increased solubility potential relative to undisturbed HLW forms. The results of this investigation would be documented in a new AMR to document the waste form response to magmatic conditions, which is expected to be available by the end of FY 2003.</p> <p>DOE will describe the method of HLW incorporation used in DOE models, including consideration of particle aggregation and the effect on waste transport. If models take credit for engineered barriers providing delay in radionuclide release, DOE will evaluate barrier performance for the duration of the hypothetical igneous event. This will be documented in an update to the igneous consequences AMR, ANL-WIS-MD-000017, which is expected to be available in FY 2003, or another appropriate technical document.</p>
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CHANGES TO EXISTING IGNEOUS ACTIVITY NRC/DOE AGREEMENTS

IA.1.02 -Examine new aeromagnetic data for potential buried igneous features (see U.S. Geological Survey, Open-File Report 00-188, Online Version 1.0), and evaluate the effect on the probability estimate. If the data survey specifications are not adequate for this use, this action is not required. DOE agreed and its initial evaluation of the report with proposed actions resulting from the review will be available to the NRC by October 11, 2000. will document the results of the evaluation in an update to the AMR, *Characterize Framework for Igneous Activity at Yucca Mountain, Nevada* (ANL-MGR-GS-000001), expected to be available in FY 2003.